

What is claimed is:

1. A process for producing a glass substrate for a magnetic recording medium by forming a surface roughness in a main surface of a glass plate that has been formed into a disk shape, which comprises:

imparting a processing mark having a permanent strain to the main surface of the glass plate in a circumferential direction thereof; and

chemically etching the whole main surface of the glass plate, so as to form the surface roughness.

2. The process according to claim 1, wherein the surface roughness is formed based on a difference in the depth of chemical etching between the portion having the processing mark and the portion not having the processing mark.

3. The process according to claim 1, wherein the processing mark is formed by rubbing the main surface of the glass plate with a processing tape in a circumferential direction of the glass plate, while supplying a processing fluid comprising a slurry to the main surface of the glass plate.

4. The process according to claim 1, wherein the chemical etching is conducted with an etchant containing at

least one of hydrofluoric acid and hydrosilicofluoric acid.

5        5. The process according to claim 1, which further comprises subjecting the glass substrate which has undergone the roughness-forming treatment to a chemical strengthening treatment in which part of the ions contained in the glass substrate are replaced with ions contained in a molten salt which have a larger ionic radius than those ions.

10        6. The process according to claim 5, which further comprises subjecting the glass substrate which has undergone the chemical strengthening treatment to cleaning of the main surface of the glass substrate with an acid aqueous solution and with an alkaline aqueous solution successively.

15        7. A glass substrate for a magnetic recording medium produced by the process according to claim 1, wherein the main surface of the glass substrate has a surface roughness of 0.5 to 1.0 nm in terms of an Ra value as determined with an AFM, and has an Rmax value, which is obtained by subtracting the minimum height of the roughness from the maximum height thereof, is 3.0 nm or higher.

20        8. The glass substrate according to claim 7, wherein the Rmax value is 15 nm or lower.

9. A glass substrate for a magnetic recording medium produced by the process according to claim 1, wherein the main surface of the glass substrate has a surface roughness of 0.2 to 0.5 nm in terms of Ra value as determined with an AFM, and has an Rmax value, which is obtained by subtracting the minimum height of the roughness from the maximum height thereof, of 2.0 nm or higher.

10. The glass substrate according to claim 7, wherein the roughness formed in the main surface of the glass substrate is linearly arranged in a circumferential direction of the substrate so that the main surface has a radial-direction line density of 5,000 to 40,000 lines per mm as determined with an AFM.

11. A magnetic recording medium which comprises: the glass substrate according to claim 7; and a magnetic recording film including a magnetic film, so that the magnetic recording film covers the main surface of the glass substrate.